

What is claimed is:

1. A high tensile strength gray iron alloy, comprising as a percentage by weight:
about 4.10% to about 4.25% carbon equivalent
about 3.5% to about 3.65% carbon;
about 0.4% to about 0.9% manganese;
about 1.5% to about 1.9% silicon;
less than about 0.12% phosphorous;
less than about 0.17% sulfur;
about 0.6% to about 0.8% molybdenum; and
about 0.3% to about 0.6% copper;
with the balance being essentially iron, and said carbon being predominantly present in said metal alloy as free carbon.
2. The gray iron alloy of claim 1, wherein said free carbon is predominantly Type A flake graphite.
3. The gray iron alloy of claim 1, wherein said amount of carbon is about 3.60%.
4. The gray iron alloy of claim 1, wherein said amount of manganese is about 0.60%.
5. The gray iron alloy of claim 1, wherein said amount of silicon is about 1.75%.

6. The gray iron alloy of claim 1, wherein said amount of molybdenum is about 0.70%.
7. The gray iron alloy of claim 1, wherein said amount of copper is about 0.40%.
8. The gray iron alloy of claim 1, further comprising chromium in an amount less than about 0.2%.
9. The gray iron alloy of claim 1, further comprising magnesium in an amount less than about 0.005%.
10. The gray iron alloy of claim 9, wherein said amount of magnesium is less than about 0.001%.
11. A high tensile strength gray iron alloy, comprising by percentage weight:
 - about 4.10% to about 4.25% carbon equivalent
 - about 3.5% to about 3.65% carbon;
 - about 0.4% to about 0.9% manganese;
 - about 1.5% to about 1.9% silicon;
 - about 0.6% to about 0.8% molybdenum; and
 - about 0.3% to about 0.6% copper;

with the balance being essentially all iron except for incidental elements and impurities commonly found in cast iron, and said carbon being predominantly present in said gray iron alloy as free carbon.

12. The gray iron alloy of claim 11, wherein said free carbon is predominantly Type A flake graphite.

13. The gray iron alloy of claim 11, further comprising phosphorous in an amount less than about 0.12%.

14. The gray iron alloy of claim 11, further comprising sulfur in an amount less than about 0.17%.

15. The gray iron alloy of claim 11, wherein chromium is present in an amount less than about 0.2%.

16. The gray iron alloy of claim 11, further comprising magnesium in an amount less than about 0.005%.

17. The gray iron alloy of claim 16, wherein said amount of magnesium is less than about 0.001%.

18. A high tensile strength gray iron alloy, consisting essentially of, as a percentage by weight:

about 4.10% to about 4.25% carbon equivalent

about 3.5% to about 3.65% carbon;

about 0.4% to about 0.9% manganese;

about 1.5% to about 1.9% silicon;

less than about 0.12% phosphorous;

less than about 0.17% sulfur;

about 0.6% to about 0.8% molybdenum; and

about 0.3% to about 0.6% copper;

with the balance being essentially iron, and said carbon being predominantly present in said metal alloy as Type A flake graphite.

19. A high tensile strength gray iron alloy, consisting essentially of, as a percentage by weight:

about 3.60% carbon;

about 0.60% manganese;

about 1.75% silicon;

less than about 0.12% phosphorous;

less than about 0.17% sulfur;

about 0.7% molybdenum; and

about 0.40% copper;

with the balance being essentially iron, and said carbon being predominantly present in said metal alloy as Type A flake graphite.

20. A high tensile strength gray iron casting having a composition comprising, as a percentage by weight:

about 4.10% to about 4.25% carbon equivalent

about 3.5% to about 3.65% carbon;

about 0.4% to 0.9% about manganese;

about 1.5% to about 1.9% silicon;

about 0.6% to about 0.8% molybdenum; and

about 0.3% to about 0.6% copper;

with the balance being essentially all iron except for incidental elements and impurities commonly found in cast iron, and said carbon being predominantly present in said gray iron as free carbon.

21. The gray iron casting of claim 20, wherein said free carbon is predominantly Type A flake graphite.

22. The gray iron casting of claim 20, wherein said amount of carbon is about 3.60%.

23. The gray iron casting of claim 20, wherein said amount of manganese is about 0.60%.

24. The gray iron casting of claim 20, wherein said amount of silicon is about 1.75%.
25. The gray iron casting of claim 20, wherein said amount of molybdenum is about 0.70%.
26. The gray iron casting of claim 20, wherein said amount of copper is about 0.40%.
27. The gray iron casting of claim 20, further comprising phosphorous in an amount less than about 0.12%;
28. The gray iron casting of claim 20, further comprising sulfur in an amount less than about 0.17%.
29. The gray iron casting of claim 20, further comprising chromium in an amount less than about 0.2%.
30. The gray iron casting of claim 20, further comprising magnesium in an amount less than about 0.005%.
31. The gray iron casting of claim 30, wherein said amount of magnesium is less than about 0.001%.

32. The gray iron casting of claim 20, wherein said casting is in the form of a brake drum.

33. The gray iron casting of claim 20, wherein said casting is in the form of a brake rotor.

34. A high tensile strength cast gray iron brake drum, said gray iron comprising as a percentage by weight:

about 3.60% carbon;

about 0.60% manganese;

about 1.75% silicon;

less than about 0.12% phosphorous;

less than about 0.17% sulfur;

about 0.7% molybdenum; and

about 0.40% copper;

with the balance being essentially iron except for incidental elements and impurities commonly found in cast iron, and said carbon being predominantly present in said gray iron as Type A flake graphite.

35. The cast gray iron brake drum of claim 34, further comprising chromium in an amount less than about 0.2%.

36. The cast gray iron brake drum of claim 34, further comprising magnesium in an amount less than about 0.005%.

37. The cast gray iron brake drum of claim 36, wherein said amount of magnesium is less than about 0.001%.